

CLAIMS

5 1. A method for transporting Internet Protocol data over a subscriber television system including a headend, a transmission medium, and a plurality of Home Communication Terminals, with at least one Home Communications Terminal authorized for receiving the Internet Protocol data, comprising the steps of:

establishing a subnet connection for transporting the Internet Protocol data from a server in the headend to an external network;

10 receiving at the headend a request for an Internet Protocol connection from the authorized Home Communication Terminal;

assigning at the headend an Internet Protocol address to the authorized Home Communications Terminal for the duration of the Internet Protocol connection;

15 establishing a route for the Internet Protocol data from the authorized Home Communications Terminal to the server and from the server to the authorized Home Communications Terminal over the transmission medium;

transmitting from the headend to the authorized Home Communications Terminal the route for the Internet Protocol connection;

communicating between the authorized Home Communications Terminal and the external network via the route and the subnet connection; and

20 releasing the route and assigned Internet Protocol address upon termination of the Internet Protocol connection.

25 2. The method of claim 1, wherein the Internet Protocol data is encapsulated and communicated between the authorized Home Communications Terminal and the headend within a digital data stream that includes television programming.

3. The method of claim 2, wherein the Internet Protocol data is encapsulated into Motion Picture Experts Group (MPEG) transport packets.

30 4. The method of claim 1, wherein the step of assigning an Internet Protocol address includes correlating the assigned Internet Protocol address to a Media Access Control (MAC) address associated with the authorized Home Communication Terminal.

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5. The method of claim 1, wherein the step of establishing the route for the Internet Protocol data includes establishing and using a portion of a continuous feed session for the Internet Protocol data from the server to the authorized Home Communication Terminal.

5        6. The method of claim 1, wherein the steps of establishing and releasing the route for Internet Protocol data comprises Digital Storage Media-Command and Control (DSM-CC) signaling techniques.

10        7. The method of claim 1, wherein the step of establishing a route includes using a protocol for the Internet Protocol data from the authorized Home Communications Terminal to the server, the protocol being selected from Time Division Multiple Access, Slotted-Aloha, and request data slot allocation.

15        8. The method of claim 1, wherein the step of establishing a route for the Internet Protocol data includes establishing and using a session security key uniquely associated with the route.

9. A method for transporting Internet Protocol data over a subscriber television system including a headend, a transmission medium, and a plurality of Home Communication Terminals, with at least one Home Communications Terminal authorized for receiving the Internet Protocol data, comprising the steps of:

5 establishing a subnet connection for transporting the Internet Protocol data from a server in the headend to an external network;

receiving at the headend a request for an Internet Protocol connection from the authorized Home Communication Terminal, including a Media Access Control (MAC) address associated with the authorized Home Communication Terminal;

10 assigning at the headend an Internet Protocol address to the authorized Home Communications Terminal for the duration of the Internet Protocol connection;

maintaining in a database in the headend, a relationship between the assigned Internet Protocol address and the Media Access Control (MAC) address associated with the authorized Home Communication Terminal, the relationship being maintained for at least the duration of the  
15 Internet Protocol connection;

establishing a downstream route for the IP data from the server to the authorized Home Communications Terminal over the transmission medium within a downstream bandwidth, wherein the downstream bandwidth includes at least a portion of a television program;

20 establishing an upstream route for the Internet Protocol data from the authorized Home Communications Terminal to the server over the transmission medium within an upstream bandwidth, wherein the upstream route uses a protocol selected from Time Division Multiple Access, Slotted-Aloha, and request data slot allocation;

transmitting from the headend to the authorized Home Communications Terminal the downstream route and the upstream route for the Internet Protocol connection;

25 communicating the Internet Protocol data between the authorized Home Communications Terminal and the server via the downstream route and the upstream route, wherein the Internet Protocol data is encapsulated into packets;

communicating the Internet Protocol data between the server and the external network via the subnet connection; and

30 releasing the assigned Internet Protocol address, the downstream route and the upstream route upon termination of the Internet Protocol connection.

*Sub B3* → 10. A method of creating and removing Internet Protocol data communications paths within a television system, comprising the steps of:

- 5        establishing a subnet connection between the television system and an external network;  
       establishing a continuous feed session within the television system for the transportation  
       of the Internet Protocol data;  
       receiving a request for a Internet Protocol connection;  
       assigning an Internet Protocol address for the duration of the Internet Protocol  
       connection to the requester of the Internet Protocol connection;  
10        designating a route including at least a portion of the continuous feed session for the  
       Internet Protocol data for the duration of the Internet Protocol connection;  
       communicating the Internet Protocol data over the established subnet and designated  
       route for the duration of the Internet Protocol connection; and  
       releasing the Internet Protocol address assignment and the route designation within the  
15        television system upon termination of the Internet Protocol connection.

11. The method of claim 10, wherein the steps of establishing a continuous feed session and releasing the route designation comprises Digital Storage Media-Command and Control (DSM-CC) signaling techniques.

Sub-B4  
12. An application server for establishing, using, and deleting an Internet Protocol data communications route within a television system between the application server and an authorized Home Communications Terminal and between the application server and an external network, the application server comprising:

5 means for establishing an external communications route between an external network and the application server located in a headend of the television system, for communicating Internet Protocol data between the application server and the external network using an Internet Protocol address from the application server, and for releasing the external communications route;

10 a processor for requesting the establishment of an internal communications route between the authorized Home Communications Terminal requesting an Internet Protocol connection and the application server for the duration of the Internet Protocol connection, releasing the internal communications route upon termination of the Internet Protocol connection, and for communicating Internet Protocol data between the authorized Home  
15 Communications Terminal and the application server over the internal communications route, wherein the Internet Protocol address for communicating with the external network is associated with the authorized Home Communications Terminal for the duration of the Internet Protocol connection and is released upon termination of the Internet Protocol connection; and

20 means for encapsulating and unencapsulating the Internet Protocol data for communication between the authorized Home Communications Terminal and the application server.

13. The application server of claim 12, wherein the means for encapsulating and unencapsulating uses Motion Picture Experts Group (MPEG) transport packets for the Internet  
25 Protocol data.

14. The application server of claim 12, wherein the processor uses a Media Access Control (MAC) address of the authorized Home Communications Terminal to associate with the Internet Protocol address for communicating with the external network.

30 15. The application server of claim 12, wherein the internal communications route uses at least a portion of a continuous feed session for communications from the applications server to the authorized Home Communication Terminal.

16. The application server of claim 12, wherein the internal communications route uses a protocol for communications from the authorized Home Communications Terminal to the applications server, the protocol selected from Time Division Multiple Access, Slotted-Aloha, and request data slots allocation.

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17. The application server of claim 12, wherein the establishment of the internal communications route uses Digital Storage Media-Command and Control (DSM-CC) signaling techniques.

18. An application server for establishing and using an Internet Protocol data communications route within a television system between the application server and an authorized Home Communications Terminal and between the application server and an external network, the application server comprising:

5 means for establishing a subnet connection to the external network;

means for receiving a request for an Internet Protocol connection from an authorized Home Communication Terminal;

10 means for requesting establishment of an internal communications route for Internet Protocol data within the television system between the applications server and the authorized Home Communication Terminal, wherein the internal communications route requested is based on the type of Internet Protocol data connection required by the authorized Home Communication Terminal;

means for assigning an Internet Protocol address to the authorized Home Communications Terminal for the duration of the Internet Protocol connection;

15 a memory for maintaining a database of all Internet Protocol addresses associated with the application server and for maintaining the relationship of the authorized Home Communications Terminal and the assigned Internet Protocol address associated with the authorized Home Communications Terminal at least for the duration of a Internet Protocol connection; and

20 means for encapsulating the Internet Protocol data received from the external network for communication to the authorized Home Communications Terminal and unencapsulating the Internet Protocol data received from the authorized Home Communications Terminal for communication to the external network;

25 means for releasing the internal communications route for Internet Protocol data upon termination of the Internet Protocol connection.

19. The application server of claim 18, wherein the means for encapsulating and unencapsulating uses Motion Picture Experts Group (MPEG) transport packets for the Internet Protocol data.

30 20. The application server of claim 18, wherein the establishment of the internal communications route uses Digital Storage Media-Command and Control (DSM-CC) signaling techniques.

21. A subscriber television system for communicating Internet Protocol data with an external network, the system comprising:

a Home Communications Terminal capable of encapsulating and unencapsulating the Internet Protocol data;

5 a headend, wherein the headend includes:

an interface to an external network for establishing a subnet connection to the external network and for communicating the Internet Protocol data with the external connection,

means for establishing, maintaining, communicating over, and releasing a communications route from the applications server to the Home Communications Terminal within the subscriber television system,

10 means for encapsulating and unencapsulating the Internet Protocol data for communication with the Home Communication Terminal; and

a transmission medium for connecting the Home Communications Terminal to the headend.

15 22. The subscriber television system of claim 21, wherein the headend means for encapsulating and unencapsulating the Internet Protocol data uses Motion Picture Experts Group (MPEG) transport packets for the Internet Protocol data.

20 23. The subscriber television system of claim 22, wherein the Motion Picture Experts Group (MPEG) transport packets for the Internet Protocol data include in each Motion Picture Experts Group (MPEG) transport packet header a Media Access Control (MAC) address associated with the Home Communication Terminal.

25 24. The subscriber television system of claim 21, wherein the headend includes a subscriber television system controller for establishing and releasing a continuous feed session.

25. The subscriber television system of claim 24, wherein the continuous feed session supports multicast Internet Protocol data from the external network.

30 26. The subscriber television system of claim 21, wherein the means for establishing, maintaining, communicating over, and releasing the communications route uses at least a portion of a continuous feed session.



27. The subscriber television system of claim 21, wherein the means for establishing, maintaining, communicating over, and releasing the communications route uses a protocol for communications from the Home Communications Terminal to the application server, the protocol selected from Time Division Multiple Access, Slotted-Aloha, and request data slot allocation.

28. The subscriber television system of claim 21, wherein the means for establishing, maintaining, communicating over, and releasing the communications route allows the external network using Dynamic Host Configuration Protocol to assign an Internet Protocol address to the Home Communication Terminal.

29. The subscriber television system of claim 21, wherein the headend includes a means for correlating a public Internet Protocol address associated with the headend to a Media Access Control (MAC) address associated with the Home Communication Terminal.

30. The subscriber television system of claim 21, wherein the Home Communications Terminal includes a means for using and the headend includes a means for establishing and using a session security key uniquely associated with the communication route.

31. The subscriber television system of claim 21, wherein the means for establishing, maintaining, communicating over, and releasing the communications route is responsive to the tuning of the Home Communications Terminal and modifies the communications route based on the tuning of the Home Communication Terminal.

32. The subscriber television system of claim 21, wherein the means for establishing, maintaining, communicating over, and releasing the communications route uses Digital Storage Media-Command and Control (DSM-CC) signaling techniques.